

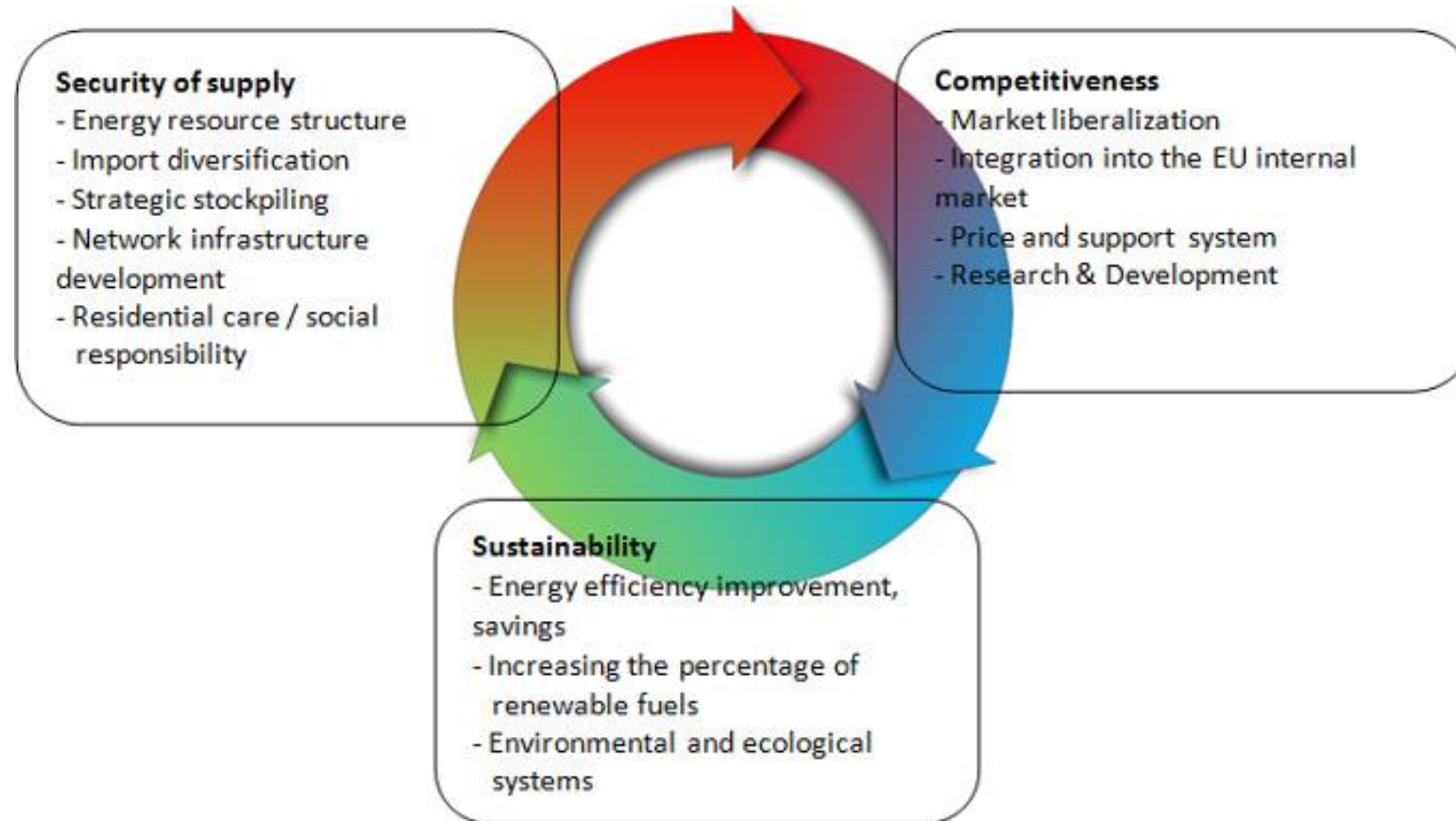
2022 Energy Crisis in Europe

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Content

- **Electricity trade in the EU**
- **Merit order effect**
- **Energy crisis – reason and manifestation**
- **Natural gas in Europe**
- **Reaction and solution**
- **Energy-related sanctions and their impact**

Electricity trade in the EU



Electricity trade in the EU

- **Energy-only Market (D, M, Q, CAL)**
- +
- **Balancing Market (H)**
 - Both compensate electricity that has been produced
- **Capacity Market**
 - compensates the mere readiness, or capacity, for power production
- **(Bilateral contracts)**

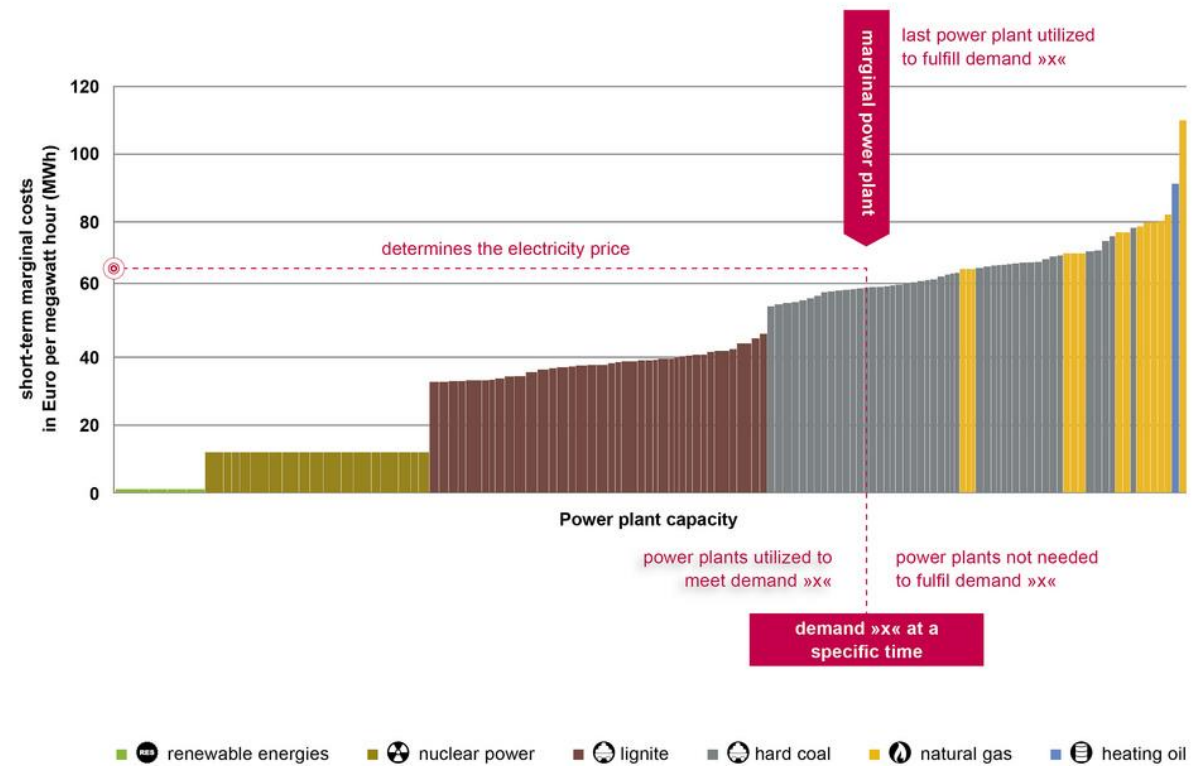
Merit Order Effect (MOE)

- way of ranking of available sources of electricity based on their marginal costs
- marginal costs of production reflect the order
- **marginal costs** is the change in the total cost that arises when the quantity produced is incremented by one unit, that is, it is the cost of producing one more unit of a good. In general terms, marginal cost at each level of production includes any additional costs required to produce the next unit. For example, if producing additional vehicles requires building a new factory, the marginal cost of the extra vehicles includes the cost of the new factory.

Merit Order Effect (MOE) Application

Öko-Institut e.V.

How supply and demand determine electricity prices
The merit order principle



SOURCE: ÖKO-INSTITUT, 2013

Merit Order Effect (MOE) Application

– How to help RES even more?

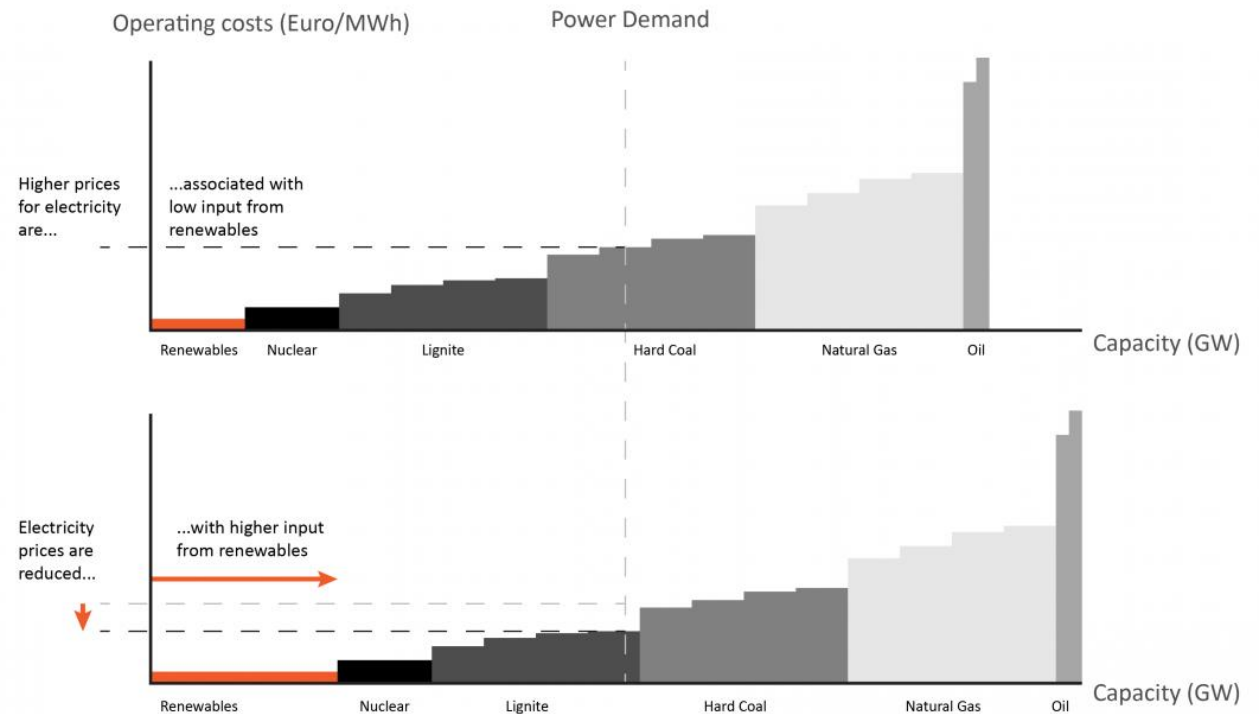
Taxes

CO2 allowances

Investment support

etc.

Illustrating electricity price fluctuations due to the Merit Order Effect



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Merit Order Effect (MOE) Application

Are RES good or bad?

Customer's point of view

- Electricity price dropped considerably
- Higher competitiveness for industry vs. support of RES paid by both

Producer's point of view

- Lower revenues
- Deformed investment environment
- New market opportunities vs. loss of market

2022 Energy Crisis

Roots of the crisis:

- „Internal“ market vs. physical unavailability of commodity
- Russian (energy) geopolitics (from 2021)
- Natural gas as a transition fuel for Energy transition
- French nuclear fleet

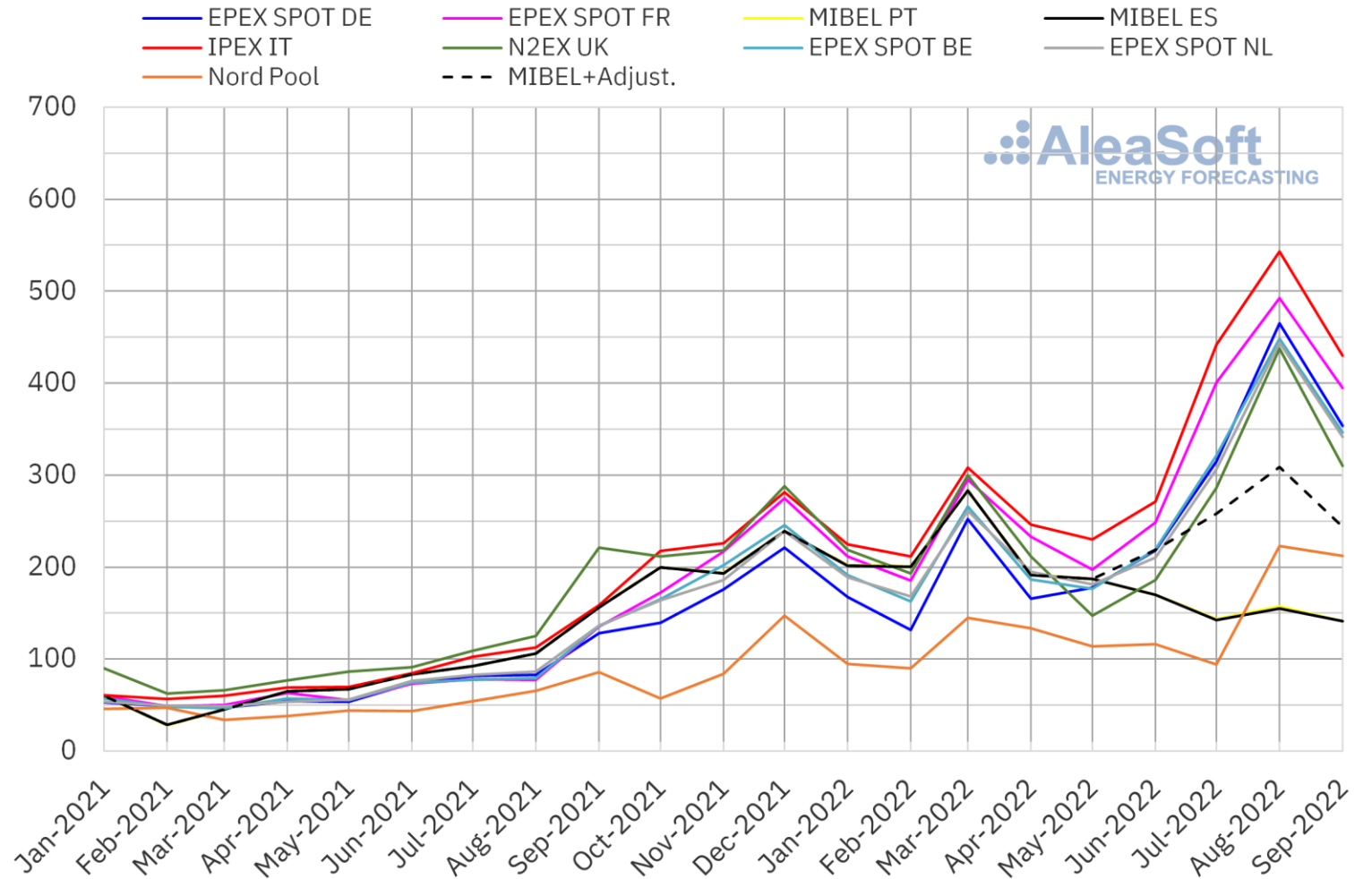
- In the Czech Republic multiplied by the fall of Bohemia Energy

2022 Energy Crisis

Manifestation in market:

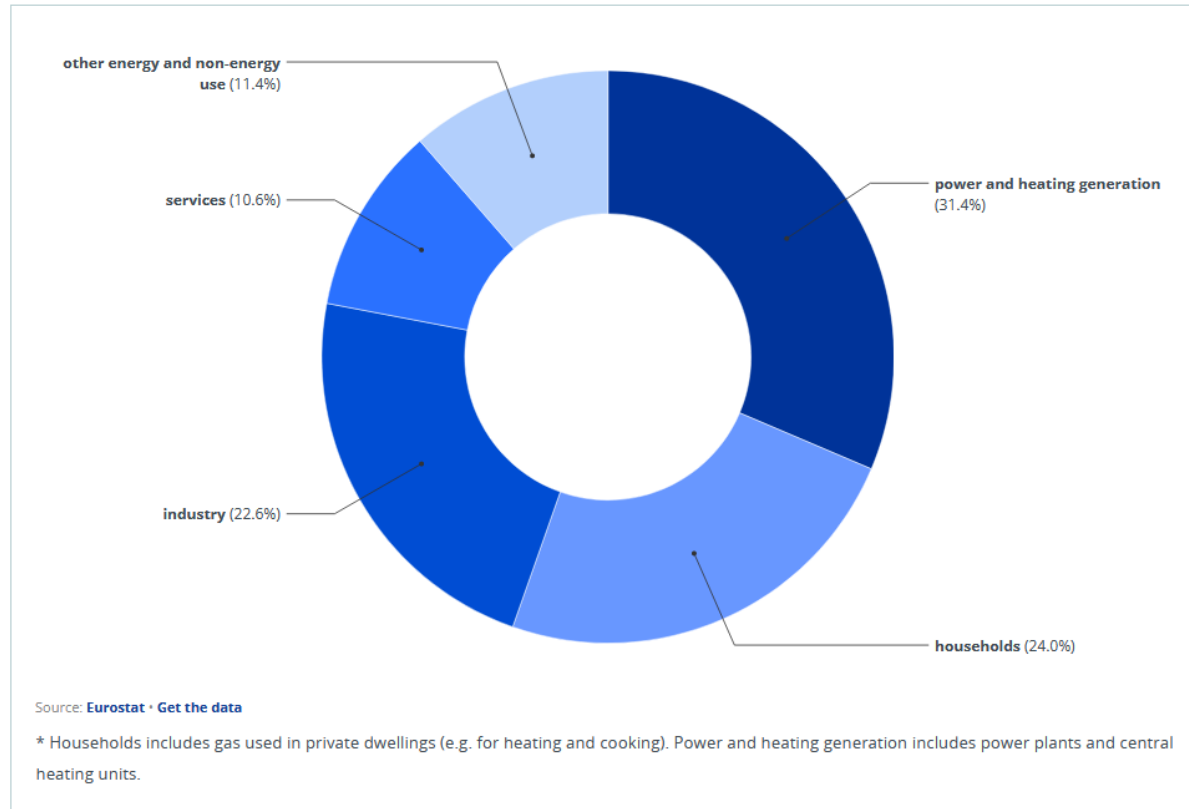
Source: Revista Eólica y del Vehículo Eléctrico

European electricity markets [€/MWh]



Natural gas in Europe

Gas consumption in the EU



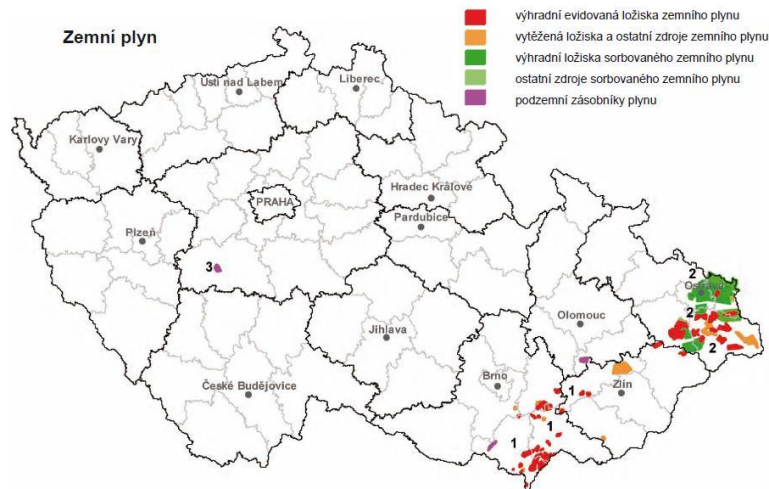
In 2021, the EU imported 83% of its natural gas.

Sources: Wikipedia, European Council

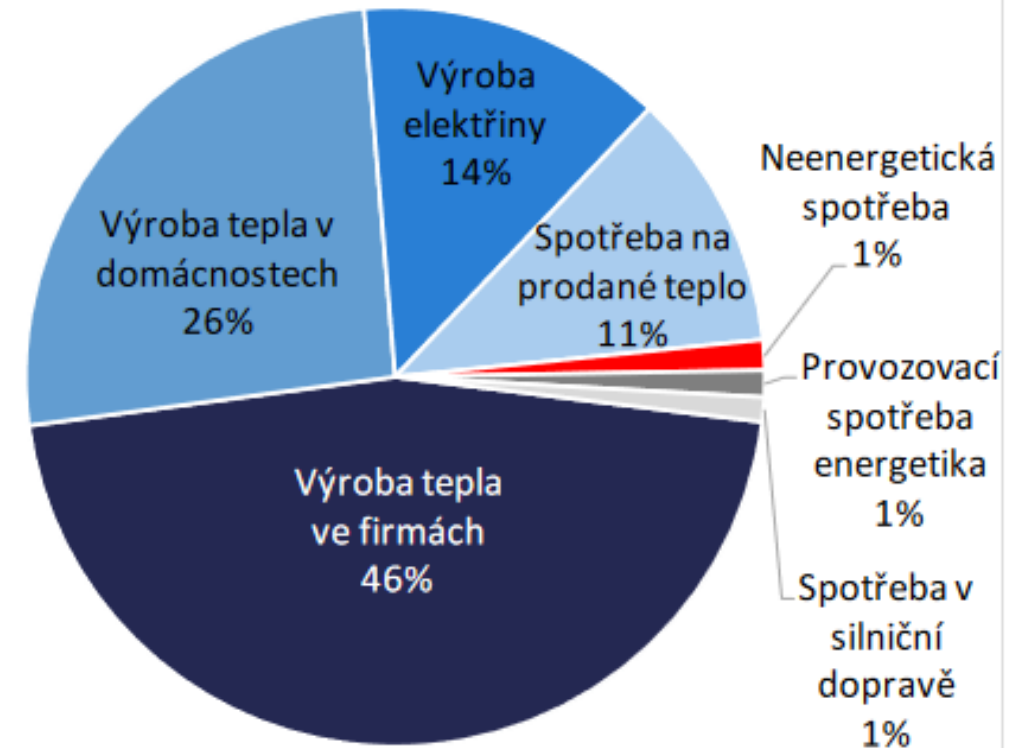


Czech Republic

- Production in 2020 0,138 bcm/y
- Import in 2020 6,2 bcm/y, of which Russia 4,5 and Germany 1,7
- Import in 2019 7,5, of which Russia 6,2 and Germany and other countries 1,3



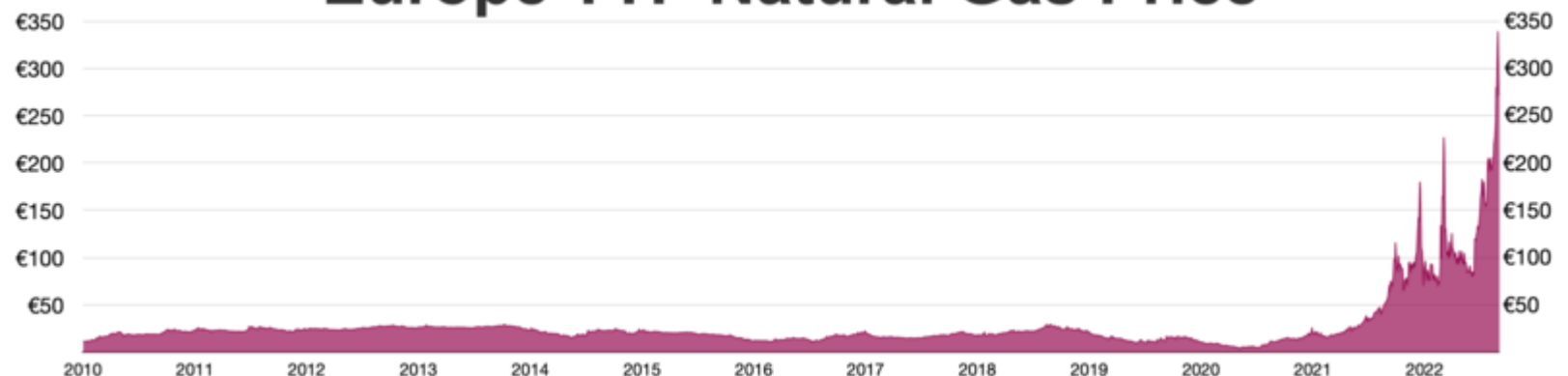
Spotřeba zemního plynu dle užití paliva
r. 2020



Natural gas in Europe

- Gas manipulation started in 2021, EU received 10 bcm gas less than in 2020
- Gazprom reduced flow to the EU in IX-XII/2021 by 13.6 bcm and transit through Belarus and Poland by 58% and 51%
- Record breaking injection of gas into Russia-based storage facilities in 2021/2022 (22% increase compared to previous season)
- Gazprom owns about 10% of EU gas storage capacity and it has been filling it very slowly compared to other operators

Europe TTF Natural Gas Price



Natural gas in Europe

- 24 February 2022 the invasion began
- 23 March 2022 Putin demands payments in rubles, G7 reject
- 29 March 2022 gas flows through Yamal-Europe decreased to zero
- 31 March 2022 Putin demands any unfriendly purchasers to pay through Gazprombank (who will change EUR/USD into rubles)
- 26-27 April 2022 Gazprom ceased exports to Poland and Bulgaria (for not paying in rubles)
- 11 May 2022 Ukraine stopped transit of gas through its territory
- 20 May 2022 Gazprom informed Finland the gas exports will be halted
- 16 June 2022 Gazprom reduced flow in Nord Stream 1 to Germany to 40% (price hike by 30%)
- 11 July 2022 Nord Stream 1 turned off because of maintenance
- 26 September 2022 Nord Stream 1 and 2 ruptured in the Baltic Sea

Reaction and solution

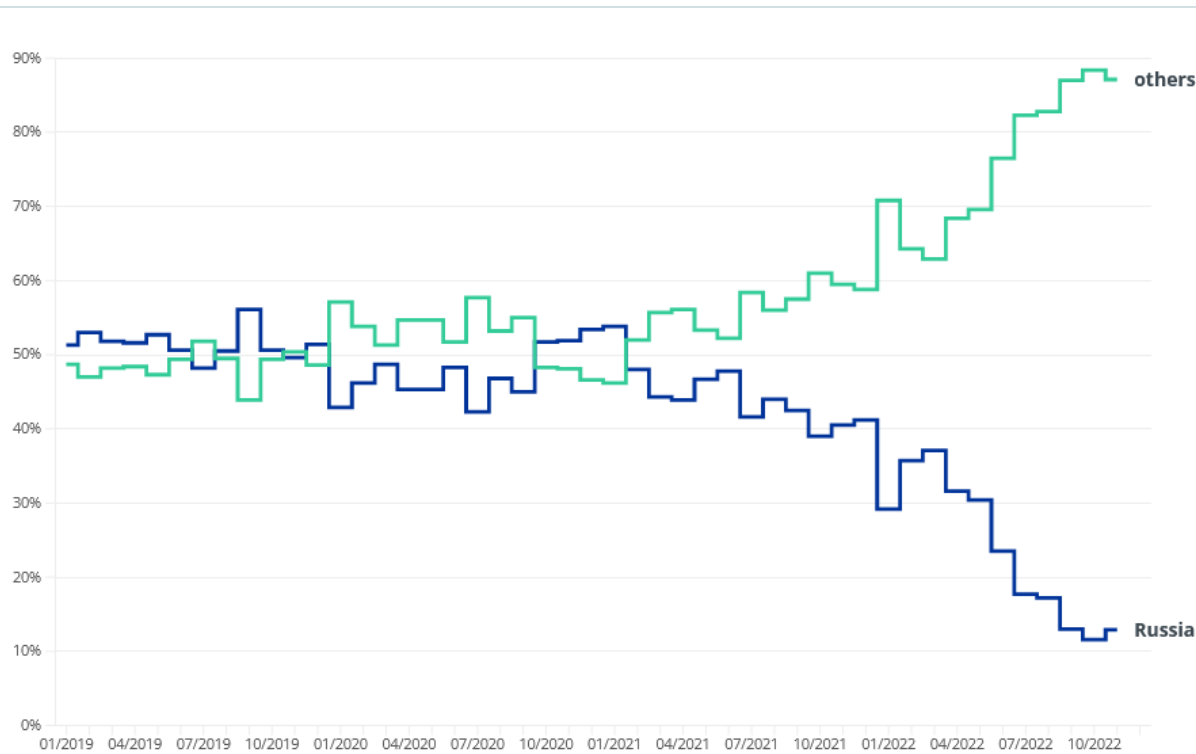
- Issues with new natural gas supply sources
- May 2022 Germany-Qatar contract from 2024
- June 2022 Isreal-Egypt-EU natural gas agreement

- Issues with tanker capacity as well as LNG gasification terminals

- Issues with price hikes: December 2022 price cap for natural gas at EUR180 per MWh + windfall tax

Reaction and solution

The EU's diversification away from Russian gas



Source: European Commission

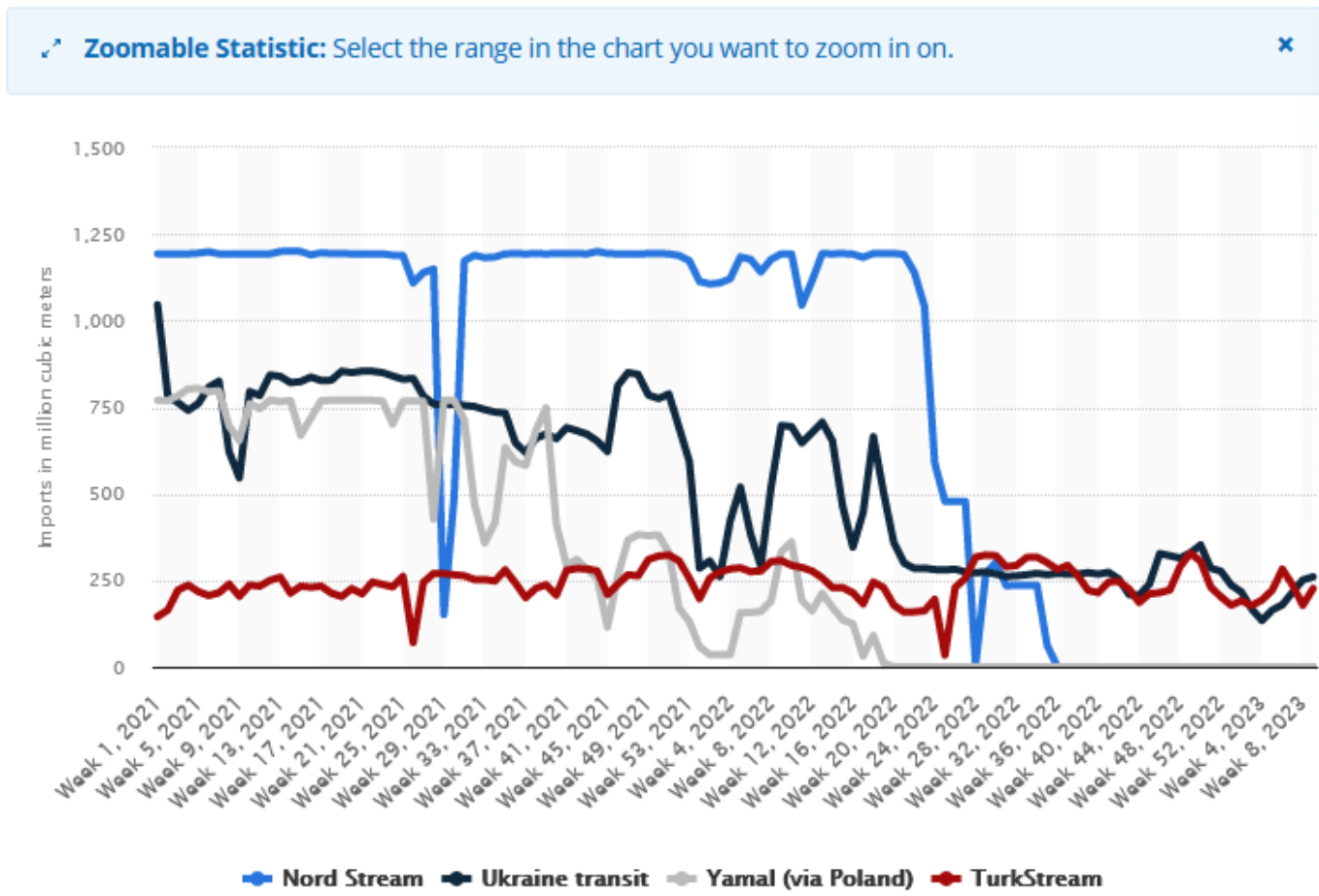
The European LNG infrastructure



LNG terminals in the EU (status 2022). Source: European Commission 2022.

Natural gas import volume from Russia in the European Union (EU) and the United Kingdom (UK) from week 1, 2021 to week 9, 2023, by exporting route

(in million cubic meters)



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Release date

March 2023

Region

Germany, Russia, United Kingdom, EU

Survey time period

Week 1, 2021 to week 9, 2023

Supplementary notes

Figures have been rounded.

Citation formats

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Case study: Czech Republic

- Gas to underground storages (12/2022 at 94,8 %) <https://gass.ga/>
- Rented capacity of Eemshaven floating terminal is 3 bcm (about 30 gas tankers)
- August 2022: Member states agreed to reduce their gas demand by 15% compared to their average consumption in the past five years, between 1 August 2022 and 31 March 2023, with measures of their own choice.
- Reduction of minimal temperature in public areas, dressing rooms, corridors, offices etc.

- Prolongation of hard coal mining until end 2023, later until end 2025
- Waiver of fees for RES support (1.10.2022 - 31.12.2023, 495 CZK/MWh without VAT)

Case study: Czech Republic

- Economical tariff (contribution of CZK 3500 to 10-12/2022 in d02d tariff)
- Czech republic's price caps from 1.1.2023 (maximum of CZK 6.05/kWh electricity, CZK 3.025/kWh gas), capping the commodity price, not the final price for end-user
- Regulation of the Council of the EU 2022/1854 from October 6, 2022
- mandatory limits on electricity production profits to EUR 180/MWh from water, solar, geothermal, biomass, waste, nuclear, lignite, oil and peat
- Czech levy on excess profits from the sale of electricity, valid from 01-12-2022 to 31-12-2023
 - Levy of 90 % from the difference between the limit fixed and the selling price
 - Wind, solar, geothermal, hydro 180 EUR/MWh
 - biogas EUR 240
 - biomass EUR 210
 - waste 100 EUR
 - nuclear EUR 70
 - Brown coal EUR 230 (<140 MWe) and EUR 170 (<140 MWe)
 - Oil, peat EUR 180
 - No limits for hard coal and natural gas

Case study: Czech Republic

- **Windfall tax**
- excess profit tax (to incomes above 120% of the average of the last four years 2018-2021), if producers make excess profits beyond the levies from EU regulations, it will be taxed
- 60 % tax
- focused on companies with excessive profits over CZK 2 billion
- focused on the following sectors: oil and gas extraction, coke production, oil refining, electricity generation, transmission and distribution, natural gas extraction and distribution, oil and gas trade, oil and gas pipeline transportation, banking sector



Source: AMO

Reaction and solution

- **Energy market reform?**
- The European Commission presented its proposal for EU electricity market reform on March 14, 2022
- No fundamental change (expected)
- Seeks to accelerate the deployment of renewables
- Energy retailers will be required to inform households about the “advantages and risks of different types of contracts
- consumers will be able to combine fixed and flexible pricing for electricity with several suppliers if they wish
- EU countries will be able to intervene in times of crisis and set retail prices for households and small businesses, provided the limit is set below their average consumption in order to incentivise demand reduction
- support long-term contracts for power supply and demand
- the European Parliament and EU countries will now examine the proposal

Energy-related sanctions and their impact

EU sanctions against Russia to stop the war in Ukraine

- 1st package (23 February 2022)
- 2nd package (25 February 2022)
- 3rd package (28 February and 2 March 2022)
- "Compliance package" (9 March 2022)
- 4th package (15 March 2022)
- 5th package (8 April 2022)
- 6th package (3 June 2022)
- 7th Maintenance and alignment package (21 July 2022)
- 8th package (5 October 2022)
- 9th package (16 December 2022)
- 10th package (25 February 2023)

Energy-related sanctions and their impact

1st package (23 February 2022)

- against Russian state and government's ability to access EU's capital and financial markets and services
- against also regional cooperation with the EU
- against 555 individuals and 52 entities

Energy-related sanctions and their impact

2nd package (25 February 2022)

- financial sector sanctions to cut Russia's access to the most important capital markets, targeting 70% of the Russian banking market, but also key state-owned companies, including the field of defence
- sanctions prohibiting the sale, supply, transfer or export to Russia of specific goods and technologies in oil refining, and will introduce restrictions on the provision of related services
- ban of sale of all aircraft, spare parts and equipment to Russian airlines
- technology sector sanctions imposing further restrictions on exports of dual-use goods and technology
- visa policy sanctions that mean diplomats and related groups, and business people will no longer have privileged access to the EU
- broadening the list to 654 individuals and 52 entities

Energy-related sanctions and their impact

3rd package (28 February and 2 March 2022)

- excluding key Russian banks from the SWIFT system
- prohibit investing in projects co-financed by the Russian Direct Investment Fund
- prohibit the provision of euro-denominated banknotes to Russia
- prohibit state-owned media Russia Today and Sputnik' to broadcast in the EU
- restrictions on trade against Belarus and add 22 individuals of the Belarus military personnel
- broadening the list to 702 individuals and 53 entities

Energy-related sanctions and their impact

"Compliance package" (9 March 2022)

- similar to the 3rd package, but aimed against Belarus
- clarify the notion of “transferable securities” so as to clearly include crypto-assets, and thus ensure the proper implementation of the sectoral restrictions in place
- further restrictive measures with regard to the export of maritime navigation goods and radio communication technology to Russia
- broadening the list to 862 individuals and 53 entities

Energy-related sanctions and their impact

4th package (15 March 2022)

- a full prohibition on transactions with certain Russian State-owned enterprises, with the exception of State-owned banks, railways and the maritime shipping register
- prohibit EU agencies to provide financial rating services to Russian companies
- a ban on imports of iron and steel products currently under EU safeguard measures as well as new investments in the Russian energy sector, with the exception of nuclear energy and the transport of energy products
- prohibit the export of luxury goods
- broadening the list to 877 individuals and 62 entities

Energy-related sanctions and their impact

5th package (8 April 2022)

- an import ban on all forms of Russian coal
- a full transaction ban and asset freeze on four additional Russian banks. A prohibition on providing high-value crypto-asset services to Russia. A prohibition on providing trust services to wealthy Russians, making it more difficult for them to store their wealth in the EU
- a full ban on Russian and Belarusian freight road operators working in the EU
- further targeted export bans which include, in particular, quantum computing, advanced semiconductors, sensitive machinery, transportation and chemicals
- additional import bans including cement, rubber products, wood, spirits (including vodka), liquor, high-end seafood (including caviar), and an anti-circumvention measure against potash imports from Belarus
- full prohibition on the participation of Russian nationals and entities in procurement contracts in the EU
- broadening the list to 1094 individuals and 80 entities

Energy-related sanctions and their impact

6th package (3 June 2022)

- a complete import ban on all Russian seaborne crude oil and petroleum products
- restrictions on chemicals that could be used in manufacturing chemical weapons
- EU operators will be prohibited from insuring and financing the transport, in particular through maritime routes
- an additional three Russian banks, Russia's largest bank Sberbank, Credit Bank of Moscow, and Russian Agricultural Bank - and the Belarusian Bank For Development And Reconstruction have been removed from SWIFT
- the broadcasting activities of another three Russian State outlets – Rossiya RTR/RTR Planeta, Rossiya 24/Russia 24, and TV Centre International – have been suspended
- further export restrictions, and financial and business services measures
- broadening the list to 1159 individuals and 98 entities

Energy-related sanctions and their impact

7th Maintenance and alignment package (21 July 2022)

- gold import ban
- export controls on dual use and advanced technology is reinforced by extending the list of items which may contribute to Russia's military and technological enhancement or the development of its defence and security sector
- Russian flagged vessels are banned to access locks to prevent the circumvention of sanctions, port access ban
- further financial sanctions, transactions for agricultural products and the transport of oil to third countries with certain state-owned entities are exempted
- broadening the list to 1213 individuals and 108 entities

Energy-related sanctions and their impact

8th package (5 October 2022)

- extension of restrictions to the oblasts of Kherson and Zaporizhzhia
- new export restrictions: coal, coking coal, specific electronic components, technical items used in the aviation sector, as well as certain chemicals
- new import restrictions: for example, a ban on the import of Russian finished and semi-finished steel products (subject to a transition period for some semi-finished), machinery and appliances, plastics, vehicles, textiles, footwear, leather, ceramics, certain chemical products, and non-gold jewellery
- implementing the G7 oil price cap
- restrictions on State-owned enterprises
- sanctions against financial, IT consultancy and other business services
- broadening the list to 1243 individuals and 115 entities

Energy-related sanctions and their impact

9th package (16 December 2022)

- additional EU export bans (drone engines, camouflage gear, additional chemical/biological equipment, riot control agents and additional electronic components found in Russian military systems on the battlefield, toy/hobby drones, complex generator devices, laptop computers and computing components, printed circuits, radio navigational systems, radio remote control apparatus, aircraft engines and parts of engines, cameras and lenses)
- additional transactions bans for Russian banks
- additional bans on Russian media outlets
- The direct exports of drone engines to Russia and the export to any third countries, such as Iran, where there is a suspicion that they will be used in Russia is now restricted. Additional economic measures against the Russian energy and mining sectors.
- broadening the list to 1274 individuals and 283 entities

Energy-related sanctions and their impact

10th package (25 February 2023)

- additional EU export bans (sensitive dual-use and advanced technologies, specific rare earths and thermal cameras with military applications)
- additional export bans are now also imposed on goods that can be easily redirected to be used to support the Russian war effort including heavy trucks not yet banned (and their spare parts), semi-trailers, and special vehicles such as snowmobiles, electric generators, binoculars, radars, compass, bridges, structures for buildings tower-like, fork-lifts trucks, cranes, electronics, machine parts, pumps, machinery for working metals, goods used in the aviation industry, complete industrial plants etc.
- additional imports bans into the EU (bitumen and related materials like asphalt, synthetic rubber and carbon blacks)
- further sanctions against the financial sector, disinformation sector and other enforcement measures
- broadening the list to 1361 individuals and 317 entities

Energy-related sanctions and their impact

2nd package (25 February 2022)

- sanctions prohibiting the sale, supply, transfer or export to Russia of specific goods and technologies in oil refining, and will introduce restrictions on the provision of related services

5th package (8 April 2022)

- an import ban on all forms of Russian coal

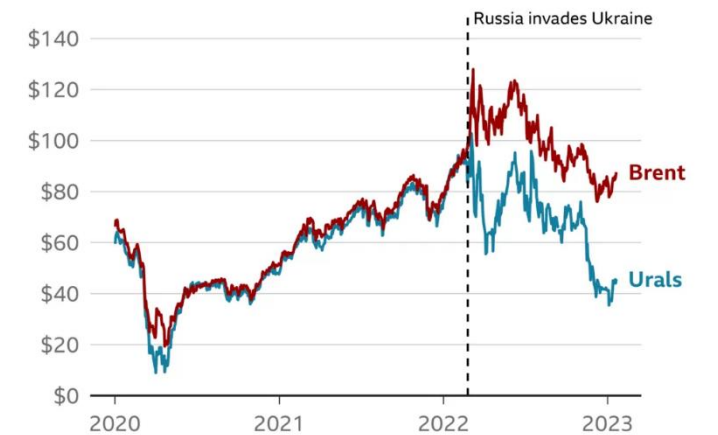
6th package (3 June 2022)

- a complete import ban on all Russian seaborne crude oil and petroleum products

8th package (5 October 2022)

- implementing the G7 oil price cap

Price of Russian oil dropping faster than Brent
US dollars per barrel

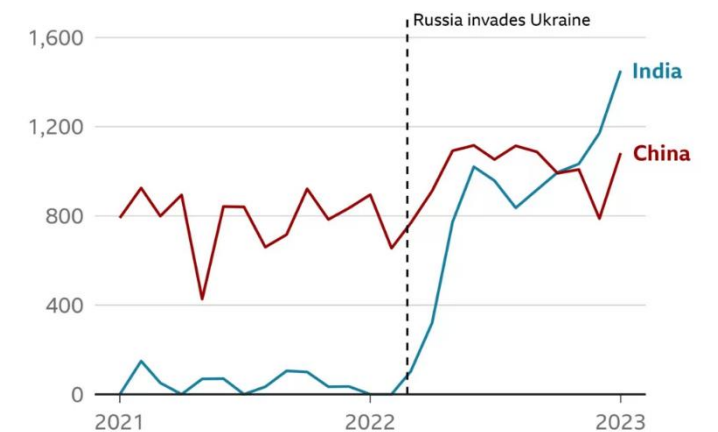


Bloomberg, ICE, Argus Media

BBC

Russia oil exports to India and China

Thousands of barrels per day



Source: Kpler

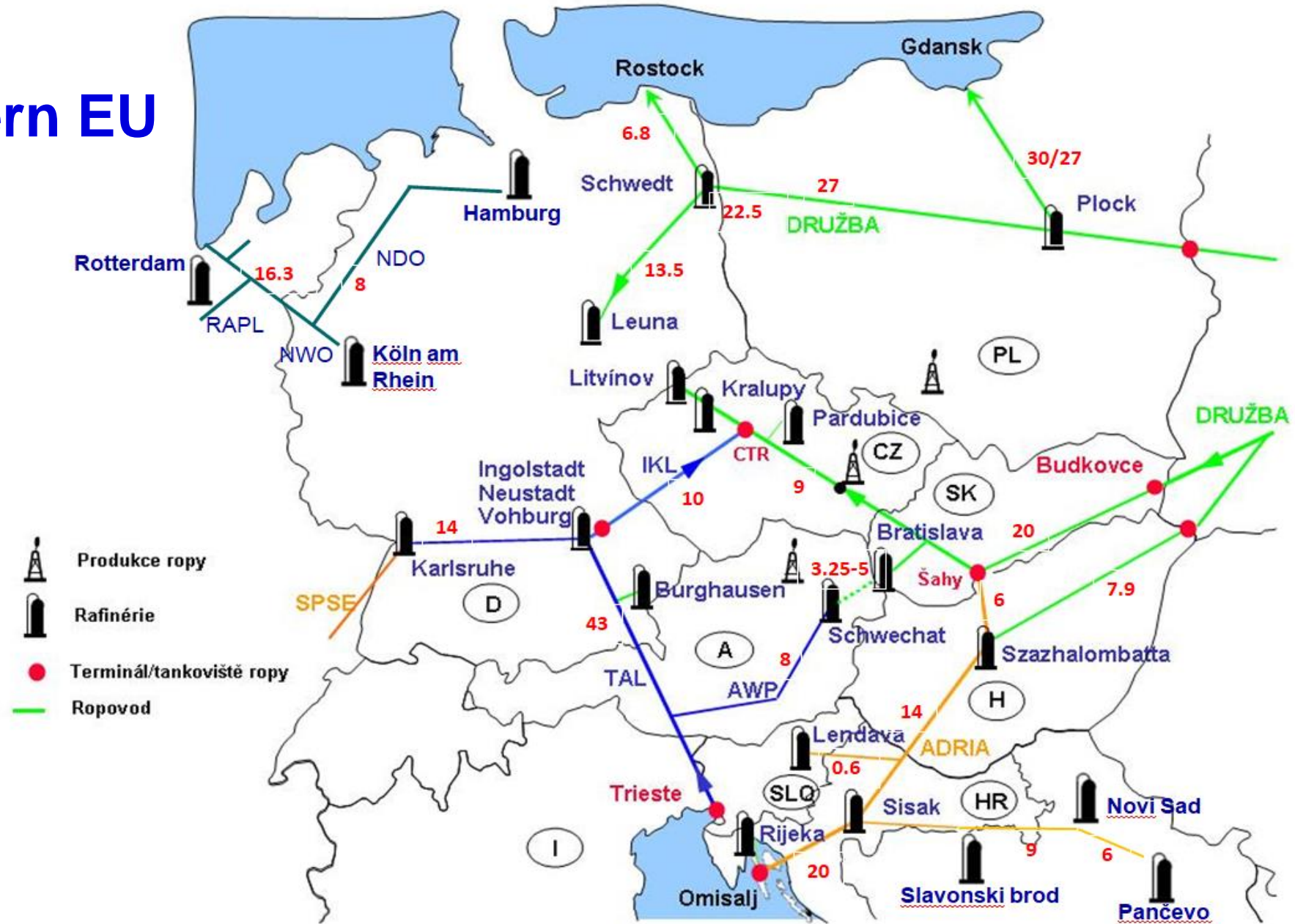
BBC

Energy-related sanctions and their impact

Complete import ban on all Russian seaborne crude oil and petroleum products

- seaborne crude oil, spot market transactions and execution of existing contracts will be permitted for six months (3 December 2022)
- petroleum products will be permitted for eight months (3 February 2023)
- Member States who have a particular pipeline dependency on Russia can benefit from a temporary exemption and continue to receive crude oil delivered by pipeline, until the Council decides otherwise. However, Member States benefiting from this exemption will not be able to resell such crude oil and petroleum products to other Member States or third countries.
- Due to its specific geographical exposure, a special temporary derogation until the end of 2024 has been agreed for Bulgaria which will be able to continue to import crude oil and petroleum products via maritime transport. In addition, Croatia will be able to authorise until the end of 2023 the import of Russian vacuum gas oil which is needed for the functioning of its refinery.
- EU operators will be prohibited from insuring and financing the transport, in particular through maritime routes, of oil to third countries (3 December 2022). This will make it particularly difficult for Russia to continue exporting its crude oil and petroleum products to the rest of the world since EU operators are important providers of such services.

Impact on Eastern EU




Impact on Eastern EU

Czech Republic in most difficult situation

- IKL capacity 10 Mta
- Continuation of TAL with the capacity of 43 Mta, problem with capacity at TAL
- In 2012 MERO bought 5% from Shell Deutschland Oil GmbH
- CZ negotiations with TAL and Germany about expansion of the pipeline (+ 4 Mta), approved by Bavaria in July 2022 and by TAL consortium in November 2022
- Refurbishment of pressure stations along the route (strategic intensification of the pipeline) will be ready by 2024
- By then, all Czech crude oil needs could be transported through IKL/TAL
- Important changes in traditional long-term supply-demand relations not only in CZ but in majority of Europe

Future?



The image features a large white circle centered on a dark, textured background. The background has a radial, wood-grain-like pattern that creates a sense of depth and focus on the central circle. The text is centered within the white circle.

Thank you for your attention!

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